

Roots and Radicals

Find the real solutions, if any, for each equation.

1. $x^2 = 49$ _____

2. $y^2 - 64 = 0$ _____

3. $3x^2 = 12$ _____

4. $c^2 - 11 = 14$ _____

5. $d^2 + 36 = 0$ _____

6. $2y^2 = -18$ _____

7. $x^3 - 27 = 0$ _____

8. $7z^3 + 13 = 13$ _____

9. $2n^2 - 1 = 31$ _____

10. $3x^3 = -3$ _____

Simplify each radical expression if it is a real number.

11. $\sqrt{81}$ _____

12. $\pm\sqrt{81}$ _____

13. $-\sqrt{81}$ _____

14. $\sqrt{0.81}$ _____

15. $\sqrt{64}$ _____

16. $-\sqrt{144}$ _____

17. $\sqrt{-4}$ _____

18. $\sqrt{-49}$ _____

19. $\sqrt[3]{8}$ _____

20. $\sqrt[3]{-8}$ _____

21. $\sqrt{9y^2}$ _____

22. $\sqrt{0.36n^6}$ _____

23. $\sqrt{a^{10}b^{14}}$ _____

24. $\sqrt{y^4z^{16}}$ _____

25. $\sqrt{100c^{32}}$ _____

26. $\sqrt{16c^2d^2}$ _____

27. $\sqrt{25a^{42}b^{44}}$ _____

28. $-\sqrt{121y^{64}z^{100}}$ _____

29. $\sqrt[3]{-27n^9}$ _____

30. $\sqrt{(y+7)^2}$ _____

31. $\sqrt{(n-5)^4}$ _____

32. $\sqrt[3]{(z+11)^3}$ _____

33. $\sqrt[3]{(d+1)^{12}}$ _____

34. $\sqrt[3]{0.000125a^6}$ _____

35. $-\sqrt{0.000001y^2z^{10}}$ _____

Applications

36. **Geometry** The perimeter of a triangle is $\sqrt[3]{64}$ cm. Express the perimeter in simplest form. _____

37. **Geometry** The length of the radius of a sphere is $\sqrt{49x^2y^6}$ in. Express the length in simplest form. _____

MIXED PRACTICE

Find the value of each expression.

38. 5^2 _____

39. 3^3 _____

40. $(-2)^5$ _____

41. $(-2y)^4$ _____

42. $(-3z^3)^3$ _____

43. $(-2x^2y)^5$ _____